Comput. Math. Applic. Vol. 14, No. 1, pp. I–V, 1987
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0097-4943/87 $3.00 + 0.00

SOFTWARE SURVEY SECTION

Editor's Note: The following Software Descriptions have been submitted by our readers in response to our call for an open exchange of information on software programs. They are offered without review or comment to provide a rapidly published, easily accessible avenue of communication. Other readers with relevant software packages are invited to complete and submit a Software Description Form (found at the end of this section).

Software package CMWA-005-S87 Calculus Lab

Contributors: Fred J. Hickernell, Hong Kong Baptist College, Department of Mathematics, 224 Waterloo Road, Kowloon, Hong Kong; Wlodek Proskurowski, University of Southern California, Department of Mathematics, DRB 306, University Park, Los Angeles, CA 90089

Brief description: The University of Southern California has developed a two-semester calculus sequence utilizing a multi-user, networked, microcomputer system with graphics terminals. The user-friendly, menu-driven software illustrates calculus concepts and helps students solve calculus problems. There are over 20 numerical routines grouped under the following headings: plotting, limits, root finding, derivatives, integration, application of integration, and series. These routines display an integrated mix of both numerical and graphic output. Each routine has its own miniature command menu which facilitates parameter input and control of the routine by the students. The functions studies are allowed to have domains which do not include the whole real line. They can also be defined by different expressions on different non-overlapping intervals. The software assumes no prior knowledge of computers and is accompanied by a handbook that explains its use. Also included is a book of specially designed problems that can be assigned by the instructor.

Potential users: Students and instructors in all calculus courses.
Fields of interest: Calculus.

§ This application program in the area of calculus has been developed for Z80-based microcomputer in BASIC to run under Turbo DOS. It is available on 8", dual-sided, single- and double-density floppy diskette. Required memory is 64K.
§ Distributed by University of California.
§ The minimum hardware configuration required is Z80 processor, Tektronix 4027 compatible terminal. No user training is required. It is self-documenting. Source code not available.
§ The package is fully operational. It has been in use at 1 site (60 micros) for approximately 2 years. The contributor is available for user inquiries.

Software package CMWA-004-S87 Linear Algebra Computer Companion

Contributor: Gareth Williams, Stetson University, Department of Math and Computer Science, DeLand, FL 32720

Brief description: A package of Linear Algebra and Matrix Algebra programs that will be useful to college professors, students and scientists. The package consists of twenty-two programs that range from matrix operations such as multiplication, powers and reduced echelon form to the Gram-Schmidt Orthogonalization Process. Programs that focus on applications of linear and matrix algebra to Markov processes, linear programming and graph theory are included. There is a program that enables one to determine currents in an electrical circuit using Kirchhoff's laws and another that simulates a space voyage to a distant star (the mathematics uses inner products). A comprehensive manual that also includes many suggestions for use of the software in courses is included. There are many options available to the user in each program. One can, for example, select a scrolling screen mode to view parts of large matrices. One can select an all steps option to view all the steps in Gaussian Elimination.

Potential users: Students/faculty, colleges, engineers.
Fields of interest: Math, computer science, engineering, business, physics, sociology, chemistry.

§ This application program in the area of linear algebra has been developed for the Apple II family in BASIC to run under DOS 3.3. It is available on 5-1/4", single-sided, double-density floppy diskette. Required memory is 48K.
§ Distributed by Allyn and Bacon, Inc.
§ The minimum hardware configuration required is one disk drive, monitor. No user training is required. There is extensive external documentation. Source code not available.
§ The package is fully operational. It has been in use at many colleges for approximately 1 year. The contributor is available for user inquiries.

Software package CMWA-003-S87 Pascal-SC Compiler and Libraries

Contributor: L.B. Rall, University of Wisconsin-Madison, Mathematics Research Center, Madison, WI 53706

Brief description: The Pascal-SC system makes the operations of floating-point arithmetic available to the user with guaranteed twelve decimal digit accuracy and controllable rounding. There is convenient operator notation for complex and interval arithmetic, as well as real, complex and interval vector and matrix arithmetic. Users can also define operators, as well as functions and procedures, to simplify programming for manipulation of numerical data types such as polynomials or quaternions, etc. Utility procedures are included for the solution of linear systems, inversion of matrices, and calculation of eigenvalues and eigenvectors, all of which return results of guaranteed accuracy. The basic system includes a compiler (which will also compile programs written in ordinary Pascal) and libraries.

Potential users: Educators, scientists, engineers, statisticians.
Fields of interest: Numerical analysis (teaching and research), scientific, engineering and statistical computation.

§ This utility program in the area of numerical analysis has been developed for Z80-based machines in machine language to run under CP/M. It is available on 8", single-sided, single-density floppy diskette. Required memory is 64K.
§ Distributed by FBSoftware.
§ The minimum hardware configuration required is two disk drives. User training is required. There is extensive external documentation. Source code not available.
§ The package is fully operational. It has been in use at 100 sites for approximately 4 years. The contributor is available for user inquiries.

Software package CMWA-003-S87 Computer Graphics Demonstration in Statistics and Probability

Contributors: F.S. Gordon, New York Institute of Technology, Old Westbury, NY 11568; S.P. Gordon, Suffolk Community College, Selden, NY 11784

Potential users: Statistics and probability educators, individual students.
Fields of interest: Statistics and probability.

§ This application program in the area of statistics has been developed for Apple II, TRS-80 Model 4, TRS-80 Color in BASIC to run under DOS, TRS-DOS. It is available on 5-1/4", single-sided floppy diskette. Required memory is 32K.
§ Distributed by MatheGraphics Software.
§ No user training is required. There is minimal documentation. Source code not available.
§ The package is fully operational. It has been in use at 5 sites for approximately 1 year. The contributor is available for user inquiries.

NAME OF JOURNAL **COMPUTERS & MATHEMATICS WITH APPLICATIONS**

PERGAMON
SOFTWARE DESCRIPTION FORM

Title of software package: ______________________________

____

____

It Is: [ ]Application program [ ]Utility [ ]Other ____________

Specific area ____________(e.g. Thermodynamics, Inventory Control)
Software developed for [name of computer(s)] ____________

in [language(s)] ______________________________

to run under [operating system] ____________

and is available in the following media:

[ ] Floppy disk/diskette. Specify:
Size ______ Density ______ [ ]Single-sided [ ]Dual-sided

[ ] Magnetic tape. Specify:
Size ______ Density ______ Character set ______

Distributed by: ______________________________

Minimum hardware configuration required: ____________

Required memory: ________ User training required: [ ]Yes [ ]No

Documentation: [ ]None [ ]Minimal [ ]Self-documenting

[ ]Extensive external documentation

Source code available: [ ]Yes [ ]No

Level of development: [ ]Design complete [ ]Coding complete
[ ]Fully operational [ ]Collaboration would be welcomed

Is software being used currently? [ ]Yes [ ]No
If yes, how long? ________ If yes, how many sites? ________

Contributor is available for user inquiries: [ ]Yes [ ]No

(continued)

RETURN COMPLETED FORM TO:

Dr. B.A. Fusaro
Department of Math Science
Salisbury State College
Salisbury, MD 21801

[This Software Description Form may be photocopied without permission]

Description of what software does [200 words]:

Potential users: ______________________________

Fields of interest: ______________________________

# # # # # # #

Name of contributor: ______________________________

Institution: ______________________________

Address: ______________________________

____

Telephone number: ______________________

# # # # # # #

Reference No. [Assigned by Journal Editor]______________

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[The information below is not for publication.]
Would you like to have your program:

Reviewed?	[ ]Yes	[ ]No	[ ]Not at this time
Marketed and distributed?	[ ]Yes	[ ]No	[ ]Not at this time

<u>[This Software Description Form may be photocopied without permission]</u>